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Robert P Seitter
RatnerPrestia
One Westlakes, Berwyn, Suite 301
P O Box 980
Valley Forge, PA 19482-0980

EXAMINER	
MURALIDAR, RICHARD V	
ART UNIT	PAPER NUMBER
2838	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/505,387	ENGELMANN ET AL.	
	Examiner	Art Unit	
	Richard V. Muralidar	2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites an "effective current" and a "measured current" in line 1. In Lines 4-7, applicant satisfactorily defines "measured current" as a current measured during an actuation period, which is then compensated for with temperature and voltage variables, to produce a nominal current. However, applicant fails to define what "effective current" is. Applicant should define "effective current" in the claim language so that it is clear what "effective current" is referring to, as well as to clarify exactly how "effective current" is different from "measured current." Applicant's specification [see page 4] is also vague concerning what "effective current" is. It appears that the deviation between effective current and measured current may be the result of saturation and hysteretic effects due to the solenoid valve's iron core. It is unclear whether this is implying that effective current itself is a result of saturation and hysteresis, or that only the deviation between effective current and measured current is. See Remarks. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Furuya et al. [U.S. 6322166].

Claims 1-12 [Canceled by applicant].

With respect to claim 13, Furuya discloses a method for reducing deviations [col. 7 lines 43-50; col. 13 lines 9-29; col. 14 lines 50-55; col. 18 lines 59-67; col. 19 lines 51-64] between the effective current and the measured current [estimated regenerative current and detected regenerated current- col. 3 lines 65-67 and col. 4 lines 1-20; gradient z and regenerative current- col. 13 lines 9-29; col. 14 lines 1-28; col. 15 lines 6-24] in a pulse-width-modulated current control [col. 2 lines 38-53, lines 60-65; col. 11 lines 33-37], in particular for electronic brake control units of motor vehicles [Fig. 3, col. 1 lines 5-19], wherein the measured current is determined at a certain predetermined time during an actuation period and a compensation is executed by way of compensation variables in response to temperature and supply voltage [col. 17 lines 60-67 and col. 18 lines 1-5], which are added to the measured current [col. 18 lines 43-48] so that a corrected nominal current is available for current control [col. 18 lines 15-67].

With respect to claim 14, Furuya discloses a method wherein the supply voltage dependency is compensated col. 17 lines 60-67 and col. 18 lines 1-5].

With respect to claim 15, Furuya discloses a method wherein the compensation variables are stored in a table, in particular in a data memory [col. 3 lines 59-64; col. 4 lines 1-20].

With respect to claim 16, Furuya discloses a method wherein several loads are driven, and the compensation variables are fixed individually for each load, in particular for each valve coil [col. 8 lines 37-49; col. 11 lines 5-15; col. 15 lines 42-52].

With respect to claim 17, Furuya discloses a method wherein an interpolation is carried out for temperatures lying between two table values in order to determine the optimal compensation variable [Fig. 17, col. 18 lines 21-28].

With respect to claim 18, Furuya discloses a method wherein an interpolation is carried out for supply voltages lying between two table values in order to determine the optimal compensation variable [col. 17 lines 3-6].

With respect to claim 19, Furuya discloses a method wherein an averaging operation is executed by way of the present nominal value and previous nominal values to compensate abrupt changes in nominal values [col. 15 lines 60-67 and col. 16 lines 1-35].

With respect to claim 20, Furuya discloses a method wherein the temperature is determined indirectly by way of the Duty Cycle adjusted by current control [col. 18 lines 6-15].

With respect to claim 21, Furuya discloses a method wherein the sum of the coil resistor and the resistor of the connected semiconductor component for driving the load is taken into consideration for the determination of temperature [col. 18 lines 6-15, the duty ratio from which temperature is determined is affected by both all resistances in the circuit, including the coil and the switch].

With respect to claim 22, Furuya discloses a method wherein the Duty Cycles of several PWM periods are averaged for temperature measurement or the determination of the indirect temperature value [the duty cycle of gradient z encodes the temperature information within in, col. 15 lines 60-67 and col. 16 lines 1-35].

With respect to claim 23, Furuya discloses a method wherein the nominal resistance value of the coil is used at the presently measured or estimated temperature of the control unit for the average value of the indirectly determined temperature quantity directly after the switching on of the ignition, in particular after the ignition's re-start [col. 14 lines 56-60; col. 19 lines 6-20].

With respect to claim 24, Furuya discloses a circuit arrangement for driving several inductive loads comprising a circuit for the PWM control of the load current, wherein the method as claimed in claim 13 is implemented as a program [Fig. 7, Fig. 9, Fig. 11, Fig. 16, Fig. 22, Fig. 25] in a microcomputer or microcomputer system [Fig. 1, control means] which is electrically connected to the PWM circuit.

With respect to claim 25, Furuya discloses a circuit arrangement for driving several inductive loads comprising a circuit for the PWM control of the load current, in

particular according to claim 24, wherein the method as claimed in claim 13 is realized at least in part by digital logic [Fig. 1, the control means is a digital logic controller].

Response to Arguments

Applicant's arguments filed 04/19/2007 have been fully considered but they are not persuasive.

Applicant's claim 13 recites, "Method for reducing deviations between the effective current and the measured current in a pulse-width-modulated current control..."

In Response to the 112 2nd regarding the meaning of "effective current": Applicant contends that the term "effective current" as claimed is merely the standard electrical engineering definition of the term. The examiner is aware of the standard definition of effective current. The point of ambiguity lies in determining exactly how "effective current" is different from "measured current". Is the "measured current" being "measured" also not effective current, as the standard meaning applies? Or is the "measured" current supposed to be something else, such as the peak or average value of current (assuming textbook definitions)? None of the subsequent steps of temperature and voltage compensation of claim 13 indicate that measured current is something different than the standard definition of effective current; in which case one would have to assume that the reduction of deviations as recited in claim 13 is occurring between effective current and effective current, which does not make sense.

Applicant comments on page 5 of Remarks that the compensation described in Furuya [U.S. 6322166] is compensation of the position of the plunger, and not compensation of the measured current. Col. 17 lines 60-65 states that the plunger

position is compensated for temperature and battery voltage. Col. 18 lines 1-5 state the regenerative current caused by the position of the plunger is then measured. If the position of the plunger is compensated and the current is then measured, the measured current will also be compensated, even if only indirectly.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard V. Muralidar whose telephone number is 571-272-8933. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl D. Easthom can be reached on 571-272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RVM
8/03/2007

KARL EASTHOM
SUPERVISORY PATENT EXAMINER